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# WU research team blazing new frontiers in study of early earth

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By [Alaa Itani](#)  
Staff Reporter

Posted January 22, 2010 at 2:44 am

Updated January 22, 2010 at 3:51 am

NASA announced that mission MoonRise, a proposal to send a lander to collect samples from the Moon for analysis, is one of three finalists in the New Frontiers Program. Bradley Jolliff, a Washington University research professor of Earth and Planetary Sciences, is the principal investigator of this mission.

The New Frontiers Program aims to select a medium-class spacecraft mission that will investigate the history of Earth's formation or even the origin of life. Eight proposals from institutions around the nation were sent in response to the New Frontiers Program 2009 Announcement of Opportunity in July 2009.

“The mission MoonRise is about understanding the impact history of the solar system,” Jolliff said.

Jolliff and his team hope that lunar samples will give insight to the series of impact events that helped reshape the inner planets.

Scientists have theorized that after the planets formed through the accretion of impacting objects, the number of impacting objects eventually decreased. But a newer theory suggests that the accretion of impacting objects tailed off, only to increase again. Lunar samples from a previous Apollo mission age impact areas on the Moon from 3.8-3.9 billion years ago, providing support for the second theory.

“The moon rocks and even meteorites point to a tremendous event 4 billion years ago,” Jolliff said.

Investigating lunar samples from MoonRise may help determine if this event occurred, and, if so, what the characteristics and time interval of the event was. Furthermore, if these impacts to Earth occurred, they would have affected the beginning formation of life and the development of early continents.

MoonRise would send a lander to the South Pole-Aitken Basin, the oldest basin on the Moon, to collect approximately 2 pounds of samples. The Jet Propulsion Laboratory (JPL) at the California Institute of Technology, a major partner of Jolliff and his team, would build the lander and design and implement the mission. Samples from the Moon would be further analyzed by the science team, which has collaborated and will continue to collaborate with scientists from institutions worldwide.

Jolliff wants Washington University students to become involved in this mission.

“We [Jolliff and his team] would like to have some really excellent student collaboration projects,” he said.

As a professor, Jolliff wants to have “maximum involvement from undergraduate and graduate students from Washington University.”

Freshman Katherine Shirley is already involved in data collection that would provide information essential in determining safe landing sites for the lander. The Lunar Reconnaissance Orbiter, which is imaging the Moon in detail, will create a large image mosaic of the basin.

“I’m happy to be involved in a really interesting field where lunar exploration could lead to further Martian exploration,” Shirley said.

Future projects also include exchanging students with partner institutions, such as the JPL.

“From my perspective, this is a great opportunity for Wash. U. to be [involved] in space exploration,” Jolliff said.

MoonRise would also engage the St. Louis community. According to Jolliff, the mission would include plans to immerse elementary through high school students in the fields of science and technology.

In addition to MoonRise, other proposals include an investigation, headed by Larry Esposito from the University of Colorado at Boulder, of the composition of Venus’ atmosphere and surface and a collection of meteorological data. The third selected proposal, headed by Michael Drake from the University of Arizona in Tucson, would send a spacecraft to collect samples from a primitive asteroid.

Finalists will be given approximately \$3.3 million to complete a 12-month mission concept study. NASA will select the final project in 2011, and the mission will take place by Dec. 30, 2018.

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- Sometimes. I'll only go out after dark if it's absolutely necessary.
- No. There have been too many crimes for me to feel safe.

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**Title:** *Baby It's Cold Outside*

**Artist:** *Zooey Deschanel & Leon Redbone*

It finally feels like December. This version of the classic Ella Fitzgerald and Louis Jordan song is from one of the greatest holiday movies of all time. That's right, "Elf."

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